Agency for Healthcare Research and Quality
Advancing Excellence in Health Care

NATIONAL QUALITY MEASURES CLEARINGHOUSE

General

Title

Diagnosis and treatment of ischemic stroke: percentage of patients who receive appropriate intervention for hypoglycemia and hyperglycemia.

Source(s)

Anderson D, Larson D, Bluhm J, Charipar R, Fiscus L, Hanson M, Larson J, Rabinstein A, Wallace G, Zinkel A. Diagnosis and initial treatment of ischemic stroke. Bloomington (MN): Institute for Clinical Systems Improvement (ICSI); 2012 Jul. 122 p. [238 references]

Measure Domain

Primary Measure Domain

Clinical Quality Measures: Process

Secondary Measure Domain

Does not apply to this measure

Brief Abstract

Description

This measure is used to assess the percentage of patients age 18 years and older initially presenting with acute symptoms of ischemic stroke who receive appropriate intervention for hypoglycemia and hyperglycemia.

Rationale

The priority aim addressed by this measure is to increase the percentage of stroke patients age 18 years and over who receive appropriate medical management within the initial 24 to 48 hours of diagnosis for prevention of complications such as:

- Dehydration
- Aspiration
- Hypoglycemia and hyperglycemia

Deep vein thrombosis
Immobility
Falling
Nutritional status decline
Hyperthermia

Stroke is the fourth leading cause of death, recently dropping from third after decades long efforts to reduce incidence by treatment of risk factors. It remains the leading cause of disability among adults. Costs of hospitalizations, other cares and lost wages are simply enormous.

Detecting and treating hypoglycemia is a leading priority in managing patients presenting with stroke syndrome. Indeed, the stroke may be cured by giving glucose, since hypoglycemia is a famous stroke mimicker by producing asymmetric neurologic deficits. An evidence-based threshold for giving a bolus of glucose is not established.

Hyperglycemic control, although deemed important to treat, based on expert opinion, has not been adequately studied in the presence of the acute stroke phase.

Most observational studies document either increased mortality or decreased functional outcome, or both, with higher glucose levels. Some have speculated that early hyperglycemia in the setting of acute stroke is simply a marker of physiologic stress and an epiphenomenon in those who have suffered severe stroke. Others have documented that it is an independent predictor of poor outcome and propose that it has a causative role. Despite the extensive body of literature describing this relationship, a definitive clinical trial of managing hyperglycemia in ischemic stroke patients to improve outcome is still lacking. It remains unclear whether early hyperglycemia in the setting of acute stroke is a marker of physiologic stress or an independent predictor of poor outcome. Usual management of hyperglycemia (glucose levels greater than 180 mg/dL) with gentle dosing of subcutaneous insulin, avoiding hypoglycemia, in a timely manner during acute ischemia would seem prudent until ongoing clinical trials address the appropriateness of more aggressive treatment measures.

Evidence for Rationale

Adams HP Jr, del Zoppo G, Alberts MJ, Bhatt DL, Brass L, Furlan A, Grubb RL, Higashida RT, Jauch EC, Kidwell C, Lyden PD, Morgenstern LB, Qureshi AI, Rosenwasser RH, Scott PA, Wijdicks EFM, American Heart Association, American Stroke Association Stroke Council, Clinical Cardiology Council. Guidelines for the early management of adults with ischemic stroke: a guideline from the American Heart Association/American Stroke Association Stroke Council, Clinical Cardiology Council, Cardiovascular Radiology [trunc]. Stroke. 2007 May;38(5):1655-711. [738 references] PubMed

Anderson D, Larson D, Bluhm J, Charipar R, Fiscus L, Hanson M, Larson J, Rabinstein A, Wallace G, Zinkel A. Diagnosis and initial treatment of ischemic stroke. Bloomington (MN): Institute for Clinical Systems Improvement (ICSI); 2012 Jul. 122 p. [238 references]

Baird TA, Parsons MW, Phanh T, Butcher KS, Desmond PM, Tress BM, Colman PG, Chambers BR, Davis SM. Persistent poststroke hyperglycemia is independently associated with infarct expansion and worse clinical outcome. Stroke. 2003 Sep;34(9):2208-14. PubMed

Bruno A, Biller J, Adams HP Jr, Clarke WR, Woolson RF, Williams LS, Hansen MD. Acute blood glucose level and outcome from ischemic stroke. Trial of ORG 10172 in Acute Stroke Treatment (TOAST) Investigators. Neurology. 1999 Jan 15;52(2):280-4. PubMed

Jorgensen H, Nakayama H, Raaschou HO, Olsen TS. Stroke in patients with diabetes. The Copenhagen Stroke Study. Stroke. 1994 Oct;25(10):1977-84. PubMed

Kiers L, Davis SM, Larkins R, Hopper J, Tress B, Rossiter SC, Carlin J, Ratnaike S. Stroke topography

and outcome in relation to hyperglycaemia and diabetes. J Neurol Neurosurg Psychiatry. 1992 Apr;55(4):263-70. PubMed

Lindsberg PJ, Roine RO. Hyperglycemia in acute stroke. Stroke. 2004 Feb;35(2):363-4. PubMed

Woo J, Lam CW, Kay R, Wong AH, Teoh R, Nicholls MG. The influence of hyperglycemia and diabetes mellitus on immediate and 3-month morbidity and mortality after acute stroke. Arch Neurol. 1990 Nov;47(11):1174-7. PubMed

Primary Health Components

Ischemic stroke; hypoglycemia; hyperglycemia

Denominator Description

Number of patients presenting with acute symptoms of ischemic stroke (see the related "Denominator Inclusions/Exclusions" field)

Numerator Description

Number of patients who have appropriate intervention for hypoglycemia and hyperglycemia

Evidence Supporting the Measure

Type of Evidence Supporting the Criterion of Quality for the Measure

A clinical practice guideline or other peer-reviewed synthesis of the clinical research evidence

Additional Information Supporting Need for the Measure

Unspecified

Extent of Measure Testing

Unspecified

State of Use of the Measure

State of Use

Current routine use

Current Use

not defined yet

Application of the Measure in its Current Use

Measurement Setting

Emergency Department

Hospital Inpatient

Professionals Involved in Delivery of Health Services

not defined yet

Least Aggregated Level of Services Delivery Addressed

Single Health Care Delivery or Public Health Organizations

Statement of Acceptable Minimum Sample Size

Unspecified

Target Population Age

Age greater than or equal to 18 years

Target Population Gender

Either male or female

National Strategy for Quality Improvement in Health Care

National Quality Strategy Aim

Better Care

National Quality Strategy Priority

Prevention and Treatment of Leading Causes of Mortality

Institute of Medicine (IOM) National Health Care Quality Report Categories

IOM Care Need

Getting Better

IOM Domain

Effectiveness

Data Collection for the Measure

Case Finding Period

The time frame pertaining to data collection is monthly.

Denominator Sampling Frame

Patients associated with provider

Denominator (Index) Event or Characteristic

Clinical Condition

Encounter

Patient/Individual (Consumer) Characteristic

Denominator Time Window

not defined yet

Denominator Inclusions/Exclusions

Inclusions
Number of patients presenting with acute symptoms of ischemic stroke

Population Definition: Patients age 18 years and older.

Exclusions
Unspecified

Exclusions/Exceptions

not defined yet

Numerator Inclusions/Exclusions

Inclusions
Number of patients who have appropriate intervention for hypoglycemia and hyperglycemia

Exclusions
Unspecified

Numerator Search Strategy

Fixed time period or point in time

Data Source

Paper medical record

Type of Health State

Does not apply to this measure

Instruments Used and/or Associated with the Measure

Unspecified

Computation of the Measure

Measure Specifies Disaggregation

Does not apply to this measure

Scoring

Rate/Proportion

Interpretation of Score

Desired value is a higher score

Allowance for Patient or Population Factors

not defined yet

Standard of Comparison

not defined yet

Identifying Information

Original Title

Percentage of patients who receive appropriate intervention for hypoglycemia and hyperglycemia.

Measure Collection Name

Diagnosis and Treatment of Ischemic Stroke

Submitter

Institute for Clinical Systems Improvement - Nonprofit Organization

Developer

Institute for Clinical Systems Improvement - Nonprofit Organization

Funding Source(s)

The Institute for Clinical Systems Improvement's (ICSI's) work is funded by the annual dues of the member medical groups and five sponsoring health plans in Minnesota and Wisconsin.

Composition of the Group that Developed the Measure

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Financial Disclosures/Other Potential Conflicts of Interest

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Guideline-Related Activities: None
Research Grants: None
Financial/Non-Financial Conflicts of Interest: MN Acute Stroke Systems Council, MDH and member of MN Time Critical Care Committee, MDH

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Research Grants: None
Financial/Non-Financial Conflicts of Interest: None

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Guideline-Related Activities: None
Research Grants: None
Financial/Non-Financial Conflicts of Interest: None

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Research Grants: None
Financial/Non-Financial Conflicts of Interest: Clinical Advisory Panel Leader, TogetherMD, LLC, MN Acute Stroke Systems Council, MDH and member of MN Time Critical Care Committee, MDH

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Guideline-Related Activities: None
Research Grants: None
Financial/Non-Financial Conflicts of Interest: None

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Guideline-Related Activities: None
Research Grants: Cardionet, MCOT use for an investigator-initiated project
Financial/Non-Financial Conflicts of Interest: Member of the Data Safety Monitoring Board for the PREVAIL study by ARTITECH (now Boston Scientific)

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Guideline-Related Activities: None
Research Grants: None
Financial/Non-Financial Conflicts of Interest: None

Andrew Zinkel, MD (Work Group Member)
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National, Regional, Local Committee Affiliations: None
Guideline-Related Activities: None
Research Grants: None
Financial/Non-Financial Conflicts of Interest: Clinical Advisory Panel Leader, TogetherMD, LLC

Adaptation

This measure was not adapted from another source.

Date of Most Current Version in NQMC

2012 Jul

Measure Maintenance

Scientific documents are revised every 12 to 24 months as indicated by changes in clinical practice and literature.

Date of Next Anticipated Revision

The next scheduled revision will occur within 24 months.

Measure Status

This is the current release of the measure.

The measure developer reaffirmed the currency of this measure in January 2016.

Measure Availability

Source available from the Institute for Clinical Systems Improvement (ICSI) Web site .

For more information, contact ICSI at 8009 34th Avenue South, Suite 1200, Bloomington, MN 55425; Phone: 952-814-7060; Fax: 952-858-9675; Web site: www.icsi.org ; E-mail: icsi.info@icsi.org.

NQMC Status

This NQMC summary was completed by ECRI Institute on November 14, 2012.

The information was reaffirmed by the measure developer on January 13, 2016.

Copyright Statement

Production

Source(s)

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